



**CHALLENGES AND OPPORTUNITIES FOR BETTER  
INTEGRATION IN SPENT FUEL MANAGEMENT;  
~~BEGINNING WITH THE END IN MIND~~**

Juan C. Subiry

NAC International

INMM Spent Fuel Management Seminar

January 14-16, 2013



**CHALLENGES AND OPPORTUNITIES FOR BETTER  
INTEGRATION IN SPENT FUEL MANAGEMENT WITH  
PROBABLE ENDS IN MIND**

# Perspective

The U.S. fractured, open market approach to interim spent fuel management has created a diversity of solutions that make it more expensive and difficult to re-integrate when it comes to final disposition.

- None of the current licensed dry storage systems are compatible with any current repository option.
- Considerable work to repackage current storage canisters into a disposal configuration
- Diversity of dry storage systems currently require a diversity of transportation systems
- Current storage systems and facilities are not well integrated into the R&D programs assessing fuel storage and disposition performance

# **“The reason we come up with a spent fuel strategy is to ensure un-interrupted operation of the site”**

Zita Martin 1/15/2013

- Nuclear Power Generators primary goal is to produce Electricity – Spent Fuel dry storage is a necessity / nuisance that will continue (CIS or Not)
- DOE’s responsibility is to pay for remedies/settlements but they have no current direction for integrating utility storage cask selection into final waste disposition requirements
  - This has contributed to a diversity of designs / lack of integration
  - Disposal packaging requirements differs from MPC systems requirements
  - \$500 M/yr for liability and increasing --- Results?

**There is limited incentives to optimize / integrate solutions when someone else pays the bill. DOE must drive the change in strategy**

# What is our strategy?

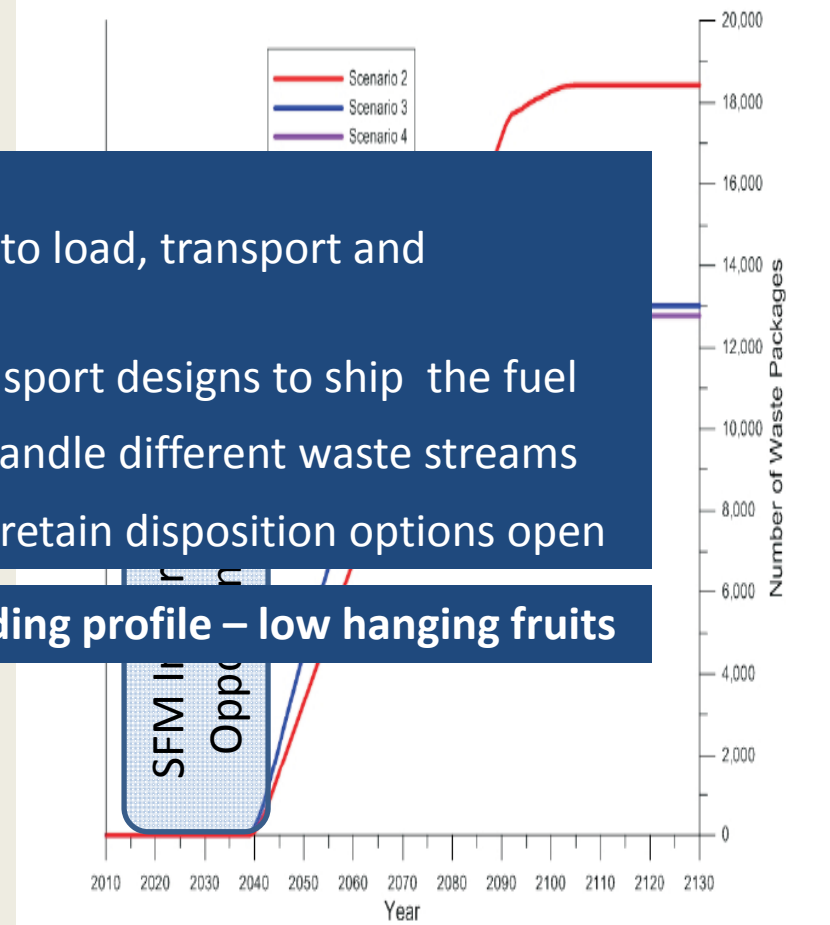
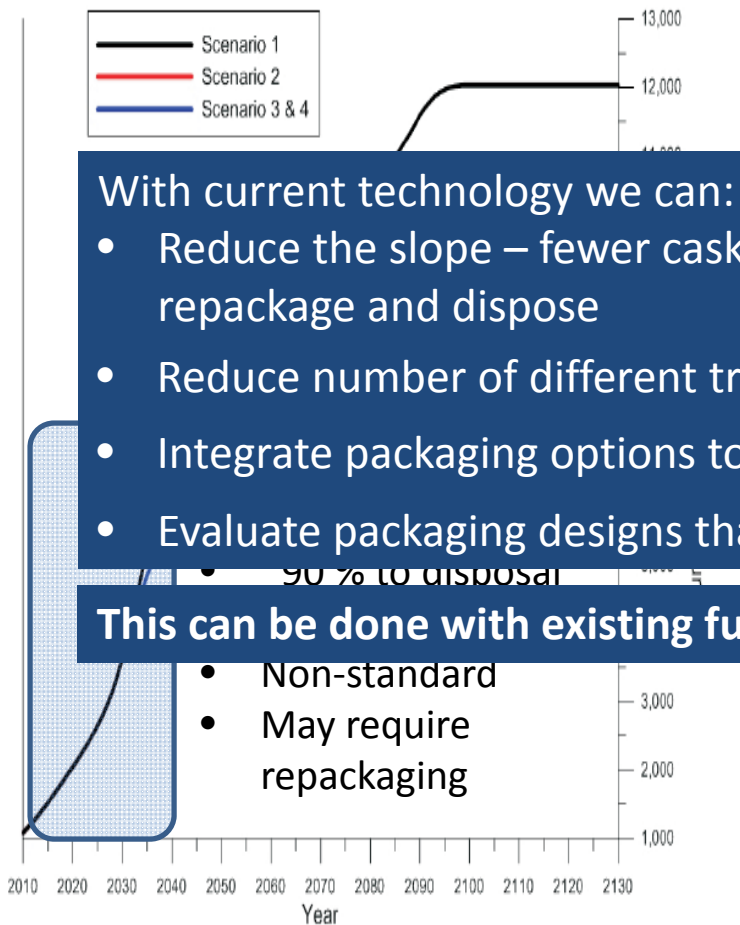
# The Options

- Long-term onsite storage ✓ On that path
- Pilot Centralized Interim Storage by 2021 / Comm. CIS by 2025 ✓ “Possible”
- Repository by 2048 ✓ “Probable”
- Spent Fuel Recycle “Old” or “New” technology ✓ TBD
- New Reactor Technologies ✓ Questionable

**Any credible near term strategy to improve our position ?**

## Onsite Dry Storage Casks

## Disposal Waste Packages



With current technology we can:

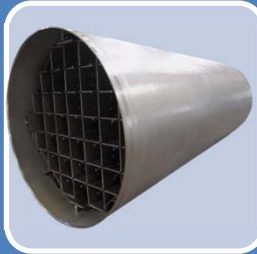
- Reduce the slope – fewer casks, to load, transport and repackage and dispose
- Reduce number of different transport designs to ship the fuel
- Integrate packaging options to handle different waste streams
- Evaluate packaging designs that retain disposition options open

This can be done with existing funding profile – low hanging fruits

- Non-standard
- May require repackaging

Source: NWTRB NUWASTE Report 2011

# Integration Opportunities



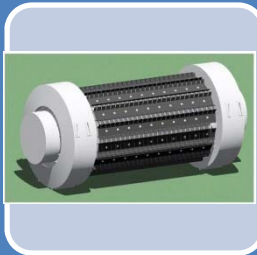
## Incentivize Migration to Higher Capacity or More Efficient Systems

- Reduce the number of current system designs loaded
- Lower costs of dry storage by at least 20%
- Reduce the number of systems to be transported and repackaged
- Reduce the size of a future centralized storage site



## Pursue True Multi-purpose System Configurations

- Transport ready storage
- Retains disposal and reprocessing options
- SF and HLW Integration
- Addresses issues related to fuel and canister performance



## Universal Transport Cask and Infrastructure

- 13 dry storage canister designs each with its own transport cask
- Significant benefits; equipment, training, crews, facilities, etc.
- Opportunity to include other DOE waste packages



# Conclusion

- In the packaging arena you don't need certainty in spent fuel disposition to pursue integration and optimization
  - Focus on universal transport technology to efficiently support CIS and other DOE transport requirements
  - Reduce the number of systems to be loaded, transported and disposed by incentivizing transition to high capacity
  - Include HLW into the integrated solutions to be proposed
- Some of these low hanging fruit benefits can be achieved with current funding profile and without any legal or political inhibitors

# Conclusion

What can we do with these lemons we got?